

Mobile Payments

With a focus on IOT technologies for in-vehicle payment





ABOUT THE PROJECT

In-vehicle payment services crucially enable automobile drivers to purchase from their car dashboards without utilising smartphones or other devices: the vehicle will facilitate the payment itself. After having described the main dynamics of this industry, in this section the goal is to catch the main elements involved in the construction of a business model canvas.

INITIAL CUSTOMERS



Users

- *years:* 35/60
- *status :* high income (4k up)
- *behaviour :* busy people, need of more quickness .Open-minded on technological innovations.
- *Influence:* Social networks, Ads, panels, by hearsay (i.e.at work, at the gym)
- *Purchase preferences :* car dealership
- *Location :* cities

PREMIUM

As a second target we consider automotive companies that do not reach a partnership and want to achieve the embedded technology in their prototypes.

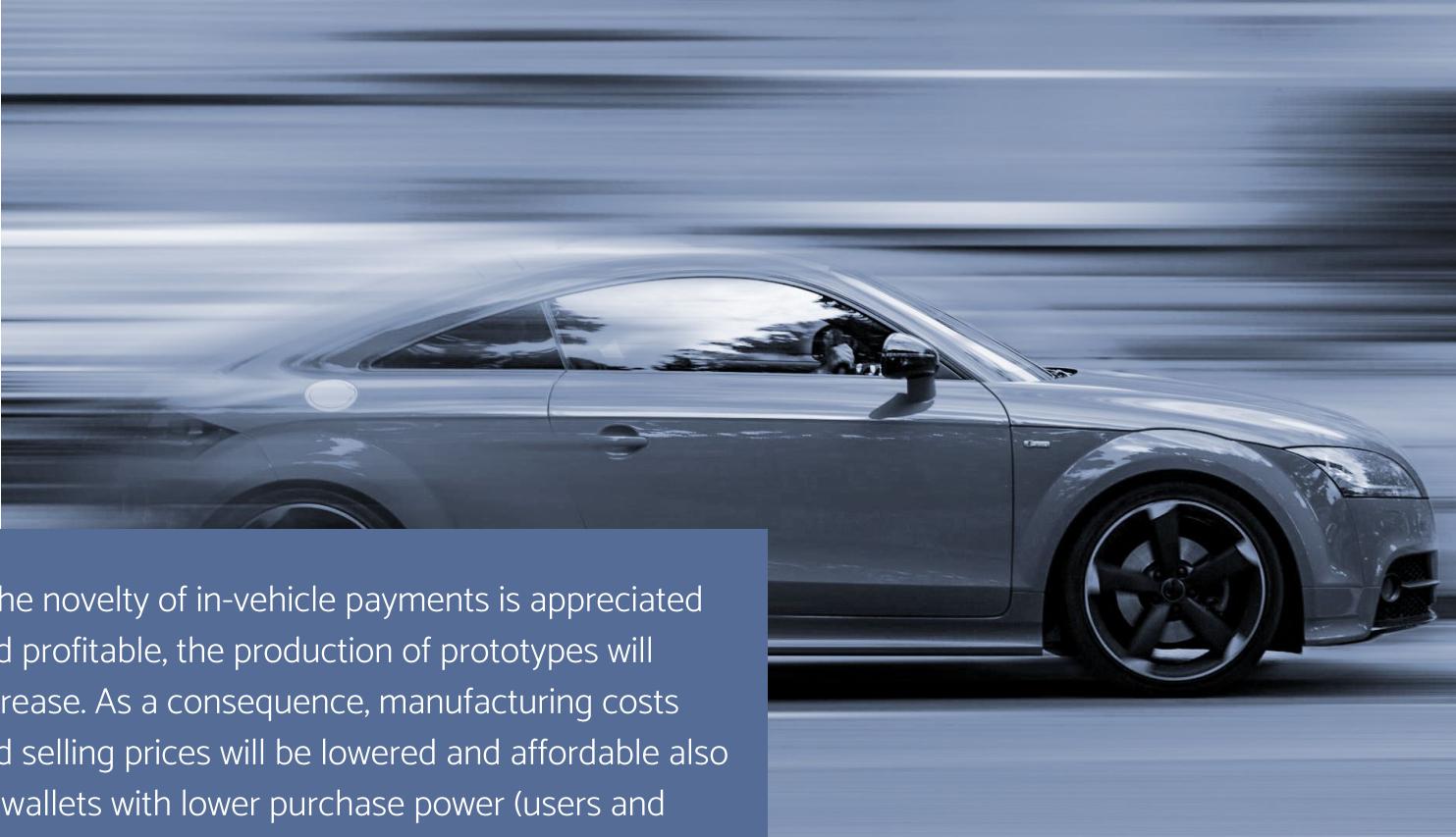
Automotive companies



- *Status:* high budget cars or professional vehicles (e.g. trucks and vans)
- *Behaviour:* awareness of the new market and technological tendencies, need to be competitive
- *Influences:* Market analysis reports

Customers over time

If the novelty of in-vehicle payments is appreciated and profitable, the production of prototypes will increase. As a consequence, manufacturing costs and selling prices will be lowered and affordable also by wallets with lower purchase power (users and automotive companies both)



From Premium to Mass Market

VALUE PROPOSITION

Users



- Speed of process (both for user, communication, system)
- Security
- Reliability of payment
- System's integrity, user interaction easiness

WHY WILL EMBEDDED SYSTEMS WIN ?

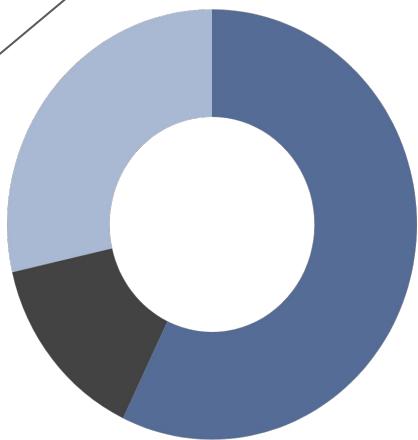
Automotive companies



- End users satisfaction
- Decreasing replication costs
- Maintenance costs greatly lowered
- End users data exploitation

REVENUE MODEL

Target 1



Subscription fees

Advertising

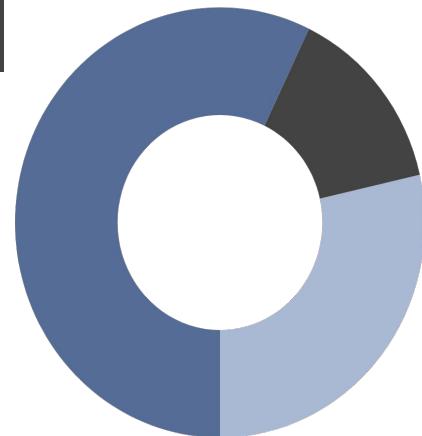
Periodic fees /
usage fees

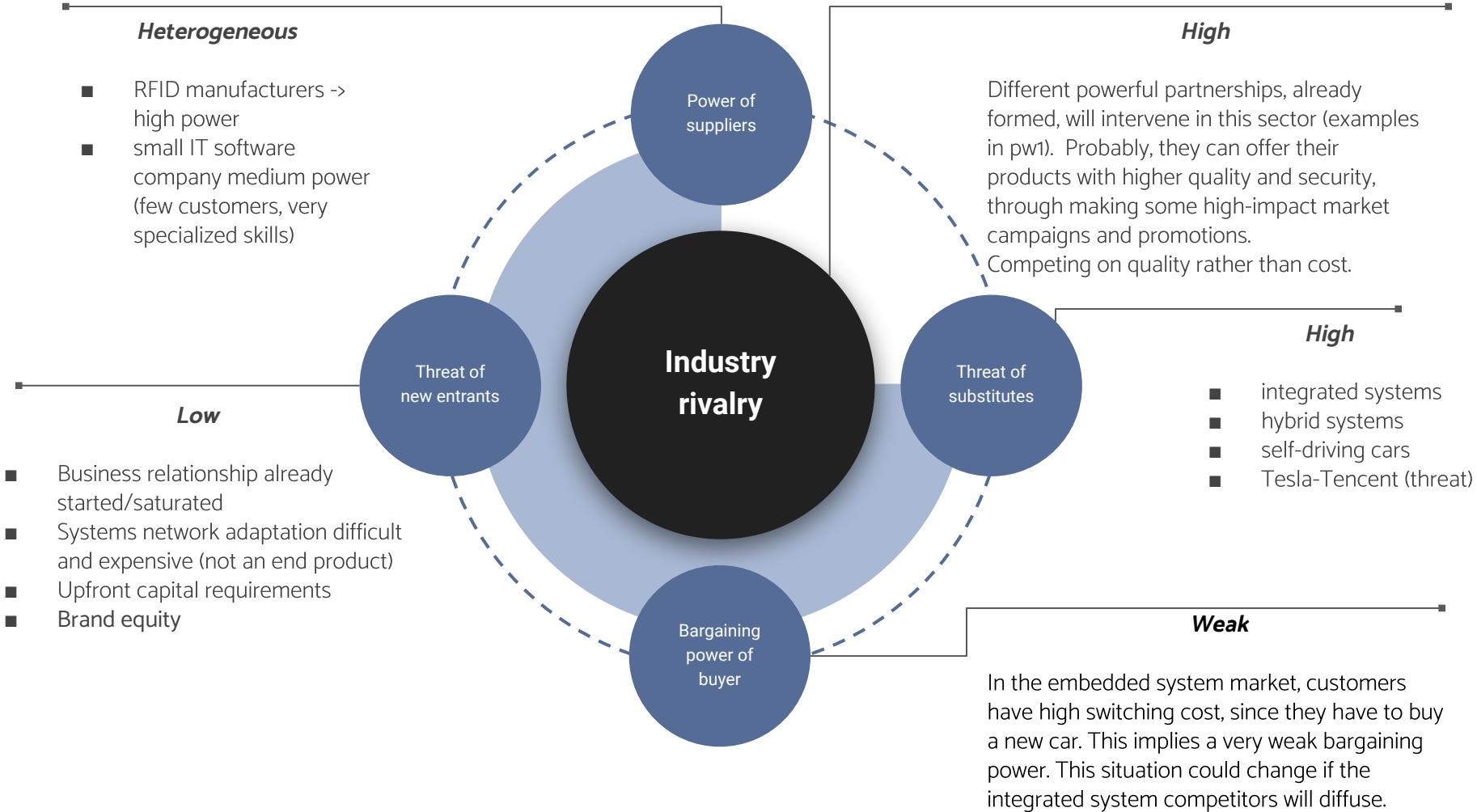
Capacity plans &
contracts

Users data

Licensing

Target 2





Value chain analysis

Paradigms

Paradigm shift between old (integrated) and new (embedded). In the value chain, the main actors that are changing are the suppliers and producers.

Complementors

Complementors could obtain a lot of benefits in case of a race between the two paradigms since they are useful for both.

Producers

Producers in the new paradigm capture a higher value in the value chain since they now produce technologies that, in the old paradigm, were supplied by other specialized companies. This means that they are able to vertically integrate more technologies than the old paradigm.

Suppliers

There are less suppliers since some of the features provided by them are now directly provided by the producers themselves.

Value chain analysis

Regarding the suppliers, we now only have internet service providers and low level electronic components providers for sensors and connectivity embedded systems. There are less suppliers since some of the features provided by them are now directly provided by the producers themselves. There is no need for e-wallet providers.

Regarding the producers, in spite of companies such as Google or Apple, we can find collaborations between automotive (but also companies related to automotive electrical components such as infotainments) and electronic payment circuits companies. Such firm industry collaboration makes possible to integrate core competences coming from different specializations, enabling the embedding of systems similar to e-wallets directly in the car system. Thus, e-wallet providers are no more needed.

Even if complementors do not significantly change (in both cases we could have banks, service/gas stations, parkings), we could have different complementary systems. It is true that in addition to online transaction security system (common to both the old and new product), we could have additional features regarding security (since is one of the most crucial aspects) especially if it is not one of the core competences of the producers.

Value chain analysis

Vertical integration is enabled also because of the strong collaboration between actors that used to operate in different sectors. Producers directly develop both most of the hardware and software needed without relying only on suppliers (with exception of electronic components as mentioned before).

Vulnerabilities and security issues could put at risk personal data and financial information. This kind of risk can limit the growth of in-vehicle payments. This is why companies specialized in secure online payments are crucial. Collaborating with such companies on the producers side or having a complementary system that guarantees such security is fundamental to the development of this application.

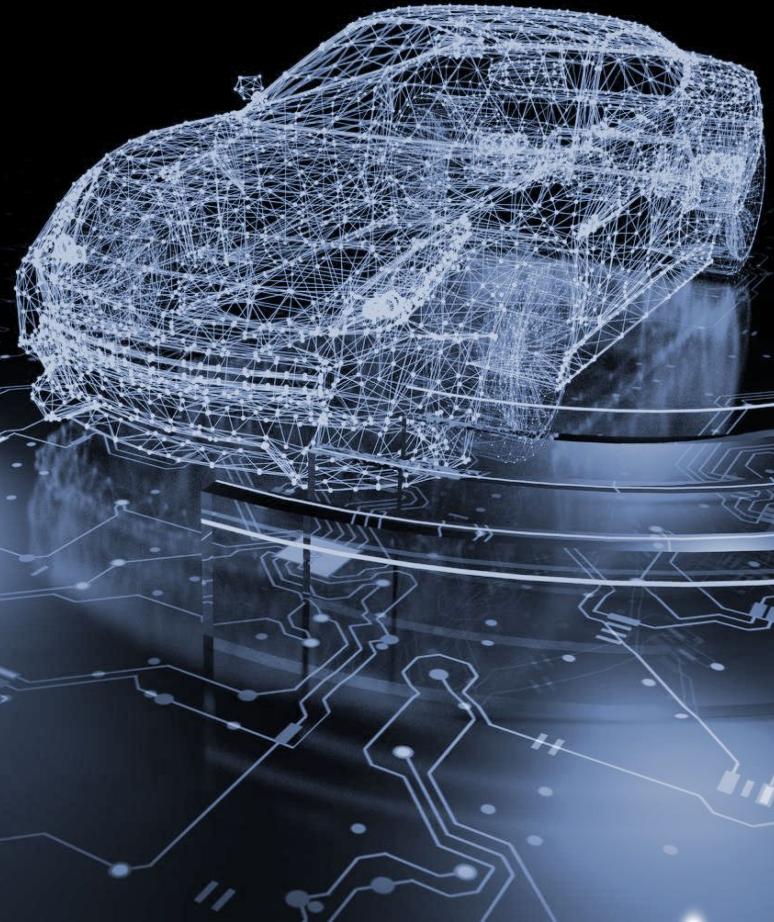


The Role of Data

The automotive industry is becoming more and more data-driven; transactions on the other hand have always placed great value on data. Therefore the merging of these two will place the utmost importance on data collection.

After an initial agreement to the terms of service pertaining to the payment platform customer interaction is no longer needed; information about their transactions is collected in the background of the payment process.

Data is collected at the moment of each transaction; some of the data never leaves the car, however a great deal of it is used to build a specific profile of the driver and the car and can also be sold to other companies according to the data Regulation of each country.



Data Types



Product Data

At each transaction the system can collect the type of products the prices, the vendors information, the time taken to close the transaction also the possible discounts applied.



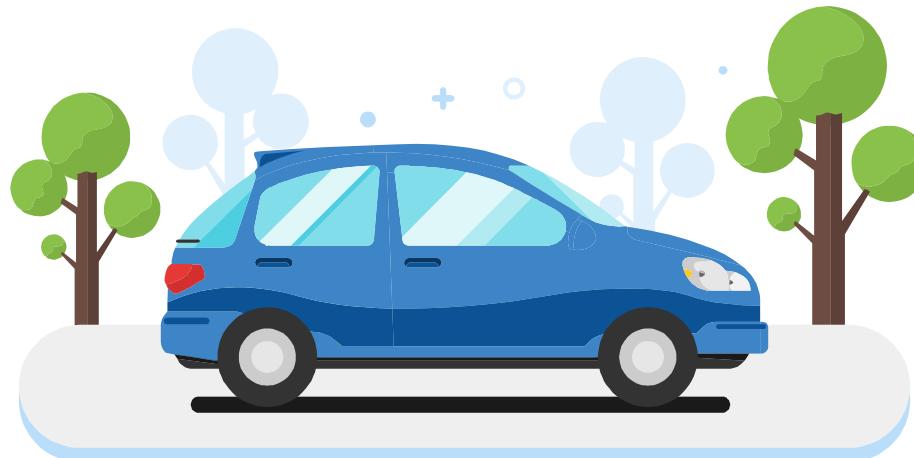
Context Data

At each transaction the system can also collect the position of the car at transaction time, the actual time of transaction and for example if the driver was parked, driving or waiting in traffic.



Circumstantial Data

The car can also collect for example the weather in which the transaction was made or the informations about the nearest competitors of the vendor which the driver didn't choose.



Algorithms

Association rules

Algorithm that looks at a customer's shopping habits and determines which are the products that are most frequently bought together.

Depending on the association rule that company needs to find the algorithm can be either supervised or unsupervised.

Customer personas and profiling

Through an unsupervised algorithm like clustering we can exploit the data to profile the driver, in order to target them with more relevant ads that will more likely result in a purchase.

Product development

The development and update process of the payment product could benefit from an Experimentation-platform that can show how customers respond to different changes.

Pricing strategy

Exploring customer habits: what is that maximum price that a customer is willing to spend for a certain product?

Switching costs

Data can also be used to personally tailor the customer experience within your payment platform. Switching to a new service means that all of these customizations geared towards the client would be lost in the change.



Data and Competitive Advantage

Value added

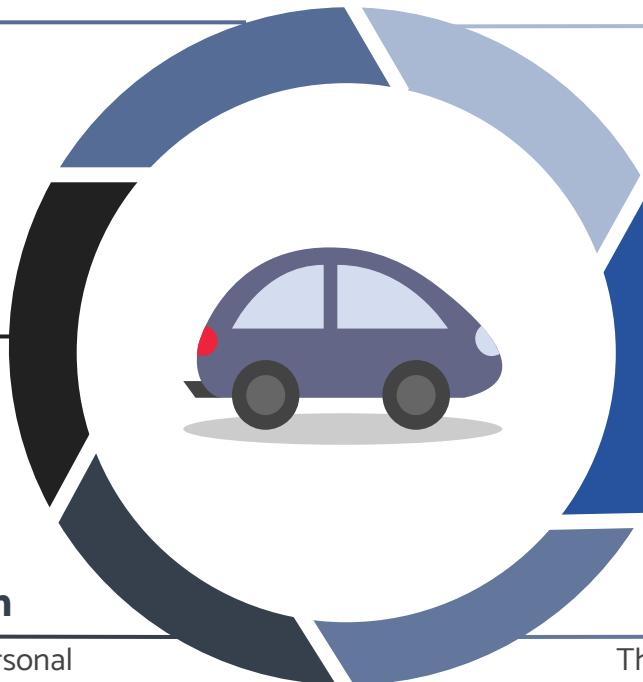
Tailored ads and service towards the customer thus the company can maximize its profit by selling data or applying custom pricing strategies.

How fast does additional data become useless?

The amount of data needed to build a customer persona is not much, therefore additional data becomes useless quite rapidly

Speed of data depreciation

Data depreciation ranges from fast(personal preferences) to medium speed(daily routines).



Is data proprietary? Can it be easily copied?

No, data about transactions are shared among car manufacturers, the payment circuit provider and the vendor.

How hard is it to imitate the data improvements?

To detect the customer habits and patterns usually a few weeks of data collection are enough. What is crucial is the quality of the algorithms.

Does data improve the product for other users?

The customizations for one customer are not easily translatable to other customers, whose preferences might differ significantly.

Competitive Positioning

Given the properties shown it would be very difficult for a company to gain a competitive edge relying only on data.

Data is a byproduct of the service being offered and not the focus itself.

Moreover the customer will choose the car to buy taking into account all the services that come with it, such as the payment system, but won't base its decision primarily on it.



Main cost items

The cost of embedded systems is higher than that of integrated systems, but we think that this new solution is feasible from the point of view of balancing revenues and costs. Having said that, it is important to bear in mind the following aspects.

Data security

IoT technologies have in general data security issues (with related privacy issues) and if this aspect is not properly addressed, it will be necessary to refit the vehicles to make the system safer. This is one of the reasons why the partnership with companies that have an expertise in payment security is fundamental in order to avoid such costs.

Data management

Since these systems are gathering data, there is a high cost related to how to properly store, manage and analyze such data. It is possible that these decisions may evolve depending on the current state of adoption of the product and bring additional costs.

Car system

Companies need to decide whether to integrate embedded/IoT system to legacy car technologies and systems or develop new central units for the cars that are going to adopt this technology in order to optimize it. The second option may be better from a technical point of view, but involves high costs.

Scope Expansion and Diversification

Car Insurance

With the plethora of transaction and driving style data collected, car companies could provide insurance for the driver with a personalized price model.

Tailored Ads

Companies could in the future become advertising space seller, knowing deeply the spending habits of the driver.



Proprietary payment circuits

In the future car companies might not want to rely on third party payment circuits and they could develop their own payment systems.

Marketing data

Data about transactions could be sold to other companies to provide a competitive edge.

Digital platforms

Instead of having different platforms or systems for different applications (such as a platform for a specific parking or gas station), we could have multi-sided digital platforms on which different actors are matched. Such platforms will enable interaction between different services in different local areas and clients of such services using in-vehicle payment methods. These platforms could also be developed not by the technology producers, but by software companies, thus we have different sides depending on the adopted solution.

If the platform is developed by the technology producers, the sides are the service providers (toll, parking, gas, eCommerce) and clients of such services (people in the car that can pay though in-vehicle payments).

If the platform is developed by third party software companies, another side is represented by the technology producers, that may or may not want to join such platform in spite of another.

Being able to have an ecosystem of services, possibly based on our geographical position, instead of having a different platform for each of them, can provide an experience to the user more similar to that of the integrated system. In the old paradigm the smartphone had a central role and it provided access to digital multi sided platforms. Bringing this kind of business model to the new paradigm, can ease the shopping experience for users and make them interact with multiple services at once.



Network externalities

In this platform there are network externalities: new customers, that use this platform to pay, attract new services that want to enter in this market; new services attract new customers that are willing to use this platform. One thing to notice is that the number of services is not the only important parameter to care about; another important thing is the geographic location of the services: if in a region there are few services that use this platform, users may be unsatisfied.

Monetizing the platform

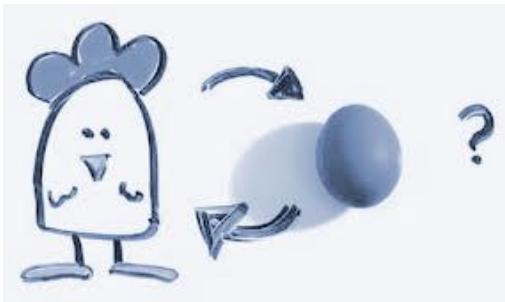
A strategic solution to monetize the platform is choosing a subsidy side. Network externalities also depend on this choice since deciding to charge more or less one side in spite of the others could bring both positive and negative effects.

Since, in order to cover more regions, attracting one more service provider, is more beneficial than attracting one client of such service, service providers could pay less transaction fees. This could enable positive network effects bringing more users to the services.



Chicken-egg problem

Launching a digital platform business requires a strategy in order to take advantage of network effects and reach the number of users required to create value.



Piggyback strategy

Connect with users from a different platform (in this case it could even be a platform from the integrated systems world) to try to convert them into users of your platform.



Marquee strategy

Attract very important suppliers on the platform. In our case this could be translated into trying to bring services that are essential or widely used into the world of in-vehicle payments.



Seeding strategy

This could be used to attract more services. Platforms could give incentives to service providers that join them.



Single-side strategy

Before becoming multi-sided platforms, such platforms could at first manage a single service being able to connect to in-vehicle payment system and allow transaction for that system.



Thank You!